1. Why Do a Literature Review?

There are several reasons why you want to do a thorough review of the literature in your research area.

You will:
- ensure that you have a comprehensive knowledge base of your research area
- ensure that your research question has not already been studied
- be able to identify any gaps or outstanding questions in the existing research literature
- be able to identify the seminal / core scholars and their work in your field
- be able to take a broader, more critical approach to the literature in your field
- be able to identify trends, potential methodologies, conceptual frameworks, and potential flaws in the existing literature.

2. Identify Your Research Question / Topic

Formulating and framing a research question is an iterative process. Your research focus will ebb and flow depending on your topic. Sometimes a very narrowly-focused topic will need to be broadened and a very broad, comprehensive topic might need to be focused. As you learn more about the content, your focus will likely change.
Draft Research Question: I’m interested in knowing whether teenage baseball rookies earn higher salaries than elderly baseball players?

It may be helpful to break down your research question or topic into key concepts. Create a Concept Chart to capture all the keywords, synonyms, phrases, subject headings that represent each concept in your research question. You can use this concept chart as a starting point for your database search and add to it as you progress.

A typical concept chart may look something like this:

<table>
<thead>
<tr>
<th>CONCEPT A</th>
<th>CONCEPT B</th>
<th>CONCEPT C</th>
</tr>
</thead>
<tbody>
<tr>
<td>[enter keywords, synonyms, subject headings, etc]</td>
<td>salaries</td>
<td>older</td>
</tr>
<tr>
<td>Ex: baseball</td>
<td>wages</td>
<td>elderly</td>
</tr>
<tr>
<td>softball</td>
<td>earnings</td>
<td>aged</td>
</tr>
<tr>
<td>sports</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In the biomedical field, the PICO model is often used to develop a research question and search strategy.

PICO stands for:
P: Population/Problem/Patient
I: Intervention
C: Comparison
O: Outcome

There may be other models in your field you can use to help generate your research question.
3. Search Strategy Tips

i) **Brainstorm synonyms**
   It will be advantageous to brainstorm possible keywords and synonyms for the main concepts of your research topic. This will ensure that you are undertaking a comprehensive search on your topic.

   For example, if you were doing research on the population of children, you would want to ensure you search *children, infants, child, youth, toddler, minors, juvenile,* etc.

ii) **Boolean operators (AND / OR):**
   Join your synonyms, using either AND, OR, to either broaden or narrow your search.

   **OR**
   - **Broadens** your search
   - Search results can include any of the search terms, use for synonyms
   - Example:
     - Youth OR teenagers OR Adolescents

   **AND**
   - **Narrows** your search
   - Search results must contain all search terms
   - Examples:
     - Safety AND Motivation
     - Concept A results AND Concept B results AND Concept C results

**Draft Research Question:** I’m interested in knowing whether teenage baseball rookies earn higher salaries than elderly baseball players?
iii) Other Search Tips

There are other search tips you can use to effectively search for information. These tips will depend on the database you are searching:

- Truncation (*), searches all variants of the root word: i.e., nurse* = nurse, nurses, nursing
- The # or ? symbol can represent any character or no character as in this example: behavior or behaviour
- Quotations around two or more words ensure that you retrieve the two or more words together, in the order that you specified, ex: “culture of safety”

4. Search the Databases

i) Getting Started:

The University Library has access to hundreds of databases; and it is often difficult to know which ones are the most appropriate to search. Some databases are subject specific while others are multi-disciplinary. Some databases are mainly indexes to journal articles while others provides access to different kinds of research resources (ex: dissertations, psychological tests, etc.).

The best place to get started is on the research guide for your subject area. These can be accessed [http://libguides.usask.ca/](http://libguides.usask.ca/) Select your subject area and see which resources have been selected for that area. The navigation on the left side of these research guides will likely give you a link to finding journal articles. Review what has been selected for your area. If your topic is multi-disciplinary, it would be useful to consult different research guides.

The research guides are full of useful information, including not only links to relevant databases, but they also provide various other information resources for that subject area. Your liaison librarian for that subject area is also listed here.

If you know the database you would like to search, you can enter the name on the Library’s homepage under the Articles & Databases tab.
ii) **Subject Heading & Keyword Searching:**
Controlled Vocabulary is a schema used to organize information based on authorized terminology, or subject headings, assigned by an indexer. Examples include *Thesaurus of Psychological Index Terms* from the American Psychological Association and MeSH (Medical Subject Headings) from the National Library of Medicine. In contrast, Natural Language has no such restrictions and users can search by any and all words. This is called free text or keyword searching.

While searching by controlled vocabulary is ideal as this provides a more systematic, efficient and consistent search, it is often advantageous to also search by keywords. This approach will ensure that you will retrieve all relevant material on your topic. However, not all databases have a controlled vocabulary and only keyword searching is possible.

Do you want to learn more? Check out this presentation “*What Search Terms Should I Use? Or Why Controlled Vocabulary Rocks*”
[http://www.slideshare.net/RebeccaTheLibrarian/introduction-to-controlled-vocabulary](http://www.slideshare.net/RebeccaTheLibrarian/introduction-to-controlled-vocabulary)

iii) **Pilot Your Search: Review, Revise, Re-Search**
It’s a good idea to pilot, or test, your search strategy in one core database in your field. Analyze the results of your search: are the results relevant? Too narrow? Too broad? What changes (if any) need to be made? This is an opportunity to refocus your research question / topic.

iv) **Finding Existing Reviews:**
Another time saving tip is to identify any review articles that have been published in your specific area of study. An existing literature review or a systematic review or meta-analysis could provide a wealth of information for your own literature review.

Many databases have the ability to limit to these types of reviews. For example, in the *PsycINFO* database, you can select the Additional Limits icon and choose Methodology: 0800 Literature Review / 0830 Systematic Review / 1200 Meta Analysis (use Ctrl key to select more than one). If you are searching in the biomedical field, you will want to search the Cochrane Library database which indexes systematic reviews.

If your databases do not offer this limiter, you can do a keyword search using the phrases “literature review”, “systematic review”, “scoping review”, “meta-analysis”, or “realist synthesis”.

Draft document: Angie Gerrard (last updated Sept 10, 2014)
5. Additional Sources to Search

i) Grey Literature (search: Google, Google Scholar, some databases)

What is grey literature? Grey literature is "that which is produced on all levels of government, academics, business and industry in print and electronic formats, but which is not controlled by commercial publishers."


Often organizations will have their own library of resources (articles, reports, etc). These are often referred to as institutional repositories. Identify key organizations and search their websites systematically.

The search for grey literature in Google can become unwieldy very quickly. Use Advanced Google when possible. A worksheet such as the one below, may be useful for you to track what keywords you searched, what sites you visited, etc.

<table>
<thead>
<tr>
<th>Grey Lit Worksheet (sample)</th>
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<tbody>
<tr>
<td>Organization, Website, etc.</td>
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There are a few Library databases that also index grey literature, including the Canadian Public Policy Collection, Canadian Health Research Collection, and Columbia International Affairs Online.
ii) **Books, Book Chapters, etc.**
Many databases index monograph materials (books, chapters, etc) and therefore these types of material types will be included in your search.

Library catalogues are another means of searching for these kinds of materials. While the University Library catalogue is one such product, it will only search our local collection. That being said, our library catalogue is a great starting point!

*WorldCat* is an example of a union catalog. This is a co-operative catalogue of library holdings worldwide, containing nearly 1 billion records catalogued by OCLC member libraries since 1971. Used mainly for information on books, it also includes materials in other formats.

iii) **Theses & Dissertations**
Just as it would be helpful to see if there is an existing literature review on your topic, the same can be said for finding an existing thesis or dissertation. *ProQuest Dissertations & Theses* indexes doctoral dissertations and selected masters theses from selected universities in North America & Europe. Full-text is available at least from 1997 to present.

For more information, including additional databases to search, consult: [http://libguides.usask.ca/FindingTheses](http://libguides.usask.ca/FindingTheses)

iv) **Cited Reference Searching (search: Web of Science, Scopus, Google Scholar)**
Cited reference searching is an excellent way of seeing how particular articles or authors have shaped the scholarly conversation. Cited reference searching can answer the question: How many times has this article been cited and by whom?

There are several databases that provide citation tracking information. Two core databases include the *Web of Science* and *Scopus*. While both of these databases are multi-disciplinary, the *Web of Science* focuses on science, social sciences and the humanities, where *Scopus* focuses more on the STEM fields (science, technology, engineering, math). In these databases, you can search by specific article or by author. *Google Scholar* also provides “Cited by” data (although much of this data needs to be carefully analyzed as there can be redundant information listed).
v) **Hand searching**  
Another search technique that is used quite frequently by expert searchers is hand searching. Hand searching is the process of skimming the bibliographies of core articles to find additional references. This process, also known as snow-balling or pearling, is an excellent method of finding related literature.

vi) **Tests & Measures**  
Depending on your research, you may need information on specific psychological tests. While the University Library does not actively collect these kinds of instruments, we do have a variety of sources that can be used to find test information (reliability, validity, reviews, etc.) as well, some may link to the test itself. For more information, consult the Tests & Measures page on the Psychology Research Guide ([http://libguides.usask.ca/psychology](http://libguides.usask.ca/psychology)).

6. **Save Your Searches & Set-Up Alerts**

i) **Database Alerts**  
Instead of having to re-search your topic every few months, let the database do the work for you! When you have perfected your search strategy in your databases, save your search and sign up for the alerting service.

To do this:

- Create an account for your research topic in each database you search. Tip: it may be helpful to use a standardized username & password for the various databases. Note the username and password in your Research Log (see #8 below).

- Save all searches so you can re-run and replicate the search if needed.

- Sign-up for the alerting service that best suits your needs (RSS feeds, email notifications).
7. Manage Your References

The best way to avoid plagiarism is to always cite your sources! Plagiarism is a serious offence so citing your sources is a sure way to avoid this situation. When in doubt, cite!

You will be dealing with a multitude of citations and wouldn’t it be great if there was software that could help you organize all these references? Good news, there is! There are several different software tools you can use to not only help you manage your citations, but they can easily create a bibliography for you in the format that you specify! *RefWorks, EndNote, Mendeley* and *Zotero* are the most commonly used tools. These software tools are easy to use and are cloud-based so you have access to your citations anywhere, anytime.

Like most databases, *Google Scholar* also allows for exporting of references to the major software tools. Go to the Settings option in *Google Scholar* and select the citation manager you have chosen to use. Click on “Save”, review your options under the Bibliographic manager menu.

You will be searching in many different places at various times. You may find it useful to create a research journal / log to track when, where, and what you searched. You can also use this journal to note any questions and/or insights that may have arisen throughout your research.

Capella University provides an example of a database research log:

Once you've identified key articles, you will need some way of organizing, summarizing and analyzing these references. A standardized template in Word or Excel is one approach that may work for you.

9. Ask your Help!

Don't be afraid to ask for assistance or advice from your liaison librarian (http://library.usask.ca/liaisons_temp.php) - we are here to help!